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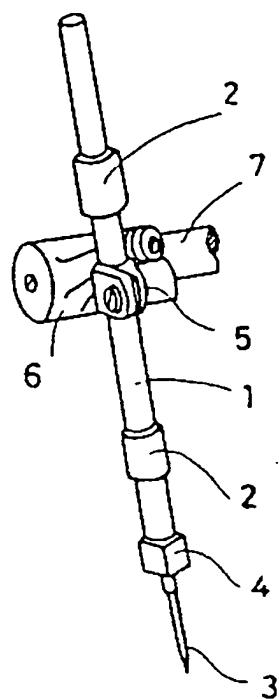
APPLICATION DATE : 17-05-89  
APPLICATION NUMBER : 01124045

APPLICANT : BROTHER IND LTD;

INVENTOR : WATANABE TAKASHI;

INT.CL. : F16C 33/24

TITLE : BEARING



ABSTRACT : PURPOSE: To obtain sliding characteristic almost constant at all times by forming a shaft with an Invar alloy having a coefficient of thermal expansion equal to or smaller than that of a bearing formed with ceramic.

CONSTITUTION: Upper and lower needle rod metals 2 are fixed to a sewing machine frame. When the rotary motion of a rotary shaft 7 is transmitted to a needle 1 via a toothed arm 6 and a toothed rod holder 5, the needle rod 1 is vertically reciprocated within the range supported with the needle rod metals 2. The needle rod 1 is made of an Invar alloy having a coefficient of thermal expansion equal to or smaller than that of the needle rod metal 2. Because the difference in the amounts of thermal expansions between the shaft and bearing is kept small in this way and the clearance between the shaft and bearing is properly maintained, sliding characteristic is almost constant at all times.

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